Appendix 3-H

Essential Fish Habitat (EFH) Designation Descriptions

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The following information describes the geographical extent and type of habitats utilized by each of the life history stages of species that have designated EFH for the three offshore alternative sites. The information below was obtained from the NOAA Guide to EFH descriptions for the Northeastern United States [http://www.nero.noaa.gov/ro/doc/list.htm]. Species and life stages listed are those with designated EFH within grids that encompass one or more of the three offshore alternative sites [http://www.nero.noaa.gov/ro/STATES4/massri.htm]. After each life stage description, a notation is included indicating which alternative site(s) have designated EFH for that life stage. The following abbreviations are used for the three offshore alternative sites: Nantucket Sound offshore alternative (NS), South of Tuckernuck offshore alternative (STI), and New Bedford/Horseshoe Shoal combination offshore alternative (NB).

American plaice (*Hippoglossoides platessoides*)

Essential Fish Habitat for American plaice is described as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated on Figures 6.1 - 6.4 and in the accompanying table in the EFH description document [http://www.nero.noaa.gov/ro/doc/am-plaice.pdf] and meet the following conditions:

Juveniles (NB*): Bottom habitats with fine-grained sediments or a substrate of sand or gravel in the Gulf of Maine as depicted in Figure 6.3. Generally, the following conditions exist where most American plaice juveniles are found: water temperatures below 17° C, depths between 45 and 150 meters and a wide range of salinities. However, according to Figure 6.3, there is no designated EFH for juvenile American plaice within Buzzards Bay or the NB alternative.

Adults (NB*): Bottom habitats with fine-grained sediments or a substrate of sand or gravel in the Gulf of Maine and Georges Bank as depicted in Figure 6.4. Generally, the following conditions exist where most American plaice adults are found: water temperatures below 17° C, depths between 45 and 175 meters and a wide range of salinities. However, according to Figure 6.4, there is no designated EFH for adult American plaice within Buzzards Bay or the NB alternative.

Atlantic butterfish (*Peprilus triacanthus*)

Eggs (NS, STI, NB): Offshore, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where butterfish eggs were collected in MARMAP ichthyoplankton surveys. Inshore, EFH is the "mixing" and/or "seawater" portions of all the estuaries where butterfish eggs are "common," "abundant," or "highly abundant" on the Atlantic coast, from Passamaquoddy Bay, Maine to James River, Virginia. Generally, butterfish eggs are collected from shore to 6000 ft and temperatures between 52 ^{o}F and 63 ^{o}F.

Larvae (NS, STI, NB): Offshore, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where butterfish larvae were collected in the NEFSC trawl surveys. Inshore, EFH is the "mixing" and/or "seawater" portions of all the estuaries where butterfish larvae are "common," "abundant," or "highly abundant" on the Atlantic coast, from Passamaquoddy Bay, Maine to James River, Virginia. Generally, butterfish larvae are collected in depths between 33 ft and 6000 ft and temperatures between 48 ^{o}F and 66 ^{o}F.

Juveniles (NS, STI, NB): Offshore, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where juvenile butterfish were collected in the NEFSC trawl surveys. Inshore, EFH is the "mixing" and/or "seawater" portions of all the estuaries where juvenile butterfish are "common," "abundant," or "highly abundant" on the Atlantic coast, from Passamaquoddy Bay, Maine to James River, Virginia. Generally, juvenile butterfish are collected in depths between 33 ft and 1200 ft and temperatures between 37 ^{o}F and 82 ^{o}F.

Adults (NS, STI, NB): Offshore, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where adult butterfish were collected in the NEFSC trawl surveys. Inshore, EFH is the

"mixing" and/or "seawater" portions of all the estuaries where adult butterfish are "common," "abundant," or "highly abundant" on the Atlantic coast, from Passamaquoddy Bay, Maine to James River, Virginia. Generally, adult butterfish are collected in depths between 33 ft and 1200 ft and temperatures between 37 ^{o}F and 82 ^{o}F.

Atlantic cod (*Gadus morhua*)

For both the Georges Bank and Gulf of Maine stocks of cod, essential fish habitat is described as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated on Figures 1.1 - 1.4 and in the accompanying table in the EFH description document [http://www.nero.noaa.gov/ro/doc/cod.pdf] and meet the following conditions:

Eggs (NB, STI): Surface waters around the perimeter of the Gulf of Maine, Georges Bank, and the eastern portion of the continental shelf off southern New England as depicted in Figure 1.1. Generally, the following conditions exist where cod eggs are found: sea surface temperatures below 12° C, water depths less than 110 meters, and a salinity range from 32 - 33‰. Cod eggs are most often observed beginning in the fall, with peaks in the winter and spring.

Larvae (NB, STI): Pelagic waters of the Gulf of Maine, Georges Bank, and the eastern portion of the continental shelf off southern New England as depicted in Figure 1.2. Generally, the following conditions exist where cod larvae are found: sea surface temperatures below 10° C, waters depths from 30 - 70 meters, and a salinity range from 32 - 33‰. Cod larvae are most often observed in the spring.

Juveniles (NB, STI): Bottom habitats with a substrate of cobble or gravel in the Gulf of Maine, Georges Bank, and the eastern portion of the continental shelf off southern New England as depicted in Figure 1.3. Generally, the following conditions exist where cod juveniles are found: water temperatures below 20° C, depths from 25 - 75 meters, and a salinity range from 30 - 35‰.

Adults (NS, STI, NB): Bottom habitats with a substrate of rocks, pebbles, or gravel in the Gulf of Maine, Georges Bank, southern New England, and the middle Atlantic south to Delaware Bay as depicted in Figure 1.4. Generally, the following conditions exist where cod adults are found: water temperatures below 10° C, depths from 10 - 150 meters, and a wide range of oceanic salinities.

Atlantic mackerel (*Scomber scombrus*)

Eggs (NS, STI, NB): Offshore, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where Atlantic mackerel eggs were collected in MARMAP ichthyoplankton surveys. Inshore, EFH is the "mixing" and/or "seawater" portions of all the estuaries where Atlantic mackerel eggs are "common," "abundant," or "highly abundant" on the Atlantic coast, from Passamaquoddy Bay, Maine to James River, Virginia. Generally, Atlantic mackerel eggs are collected from shore to 50 ft and temperatures between 41 ^{o}F and 73 ^{o}F.

Larvae (NS, STI, NB): Offshore, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina that comprise the highest 75% of the catch where Atlantic mackerel larvae were collected in the MARMAP ichthyoplankton survey. Inshore, EFH is also the "mixing" and/or "seawater" portions of all the estuaries where Atlantic mackerel larvae are "common," "abundant," or "highly abundant" on the Atlantic coast, from Passamaquoddy Bay, Maine to James River, Virginia. Generally, Atlantic mackerel larvae are collected in depths between 33 ft and 425 ft and temperatures between 43 ^{o}F and 72 ^{o}F.

Juveniles (NS, STI, NB): Offshore, EFH is the pelagic water found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where juvenile Atlantic mackerel were collected in the NEFSC trawl surveys. Inshore, EFH is the "mixing" and/or "seawater" portions of all the estuaries where juvenile Atlantic mackerel are "common," "abundant," or "highly abundant" on the Atlantic coast, from Passamaquoddy Bay, Maine to James River, Virginia. Generally, juvenile Atlantic mackerel are collected from shore to 1050 ft and temperatures between 39 ^{o}F and 72 ^{o}F.

Adults (NS, STI, NB): Offshore, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina, in areas that comprise the highest 75% of the catch where adult Atlantic mackerel were collected in the NEFSC trawl surveys. Inshore, EFH is the "mixing" and/or "seawater" portions of all the estuaries where adult Atlantic mackerel are "common," "abundant," or "highly abundant" on the Atlantic coast, from Passamaquoddy Bay, Maine to James River, Virginia. Generally, adult Atlantic mackerel are collected from shore to 1250 ft and temperatures between 39 ^{o}F and 61 ^{o}F.

Atlantic sea herring (*Clupea harengus*)

Essential Fish Habitat for Atlantic herring is described as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated on Figures 3.1 - 3.4 and in the accompanying table in the EFH description document [http://www.nero.noaa.gov/ro/doc/herring.pdf] and meet the following conditions:

Larvae (STI): Pelagic waters in the Gulf of Maine, Georges Bank, and southern New England that comprise 90% of the observed range of Atlantic herring larvae as depicted in Figure 3.2. Generally, the following conditions exist where Atlantic herring larvae are found: sea surface temperatures below 16° C, water depths from 50 - 90 meters, and salinities around 32 ‰. Atlantic herring larvae are observed between August and April, with peaks from September through November.

Juveniles (NS, STI, NB): Pelagic waters and bottom habitats in the Gulf of Maine, Georges Bank, southern New England and the middle Atlantic south to Cape Hatteras as depicted in Figure 3.3. Generally, the following conditions exist where Atlantic herring juveniles are found: water temperatures below 10° C, water depths from 15 - 135 meters, and a salinity range from 26 - 32 ‰.

Adults (NB, STI): Pelagic waters and bottom habitats in the Gulf of Maine, Georges Bank, southern New England and the middle Atlantic south to Cape Hatteras as depicted in Figure 3.4. Generally, the following conditions exist where Atlantic herring adults are found: water temperatures below 10° C, water depths from 20 - 130 meters, and salinities above 28 ‰.

Black sea bass (*Centropristis striata*)

Larvae (NS, STI, NB): 1) North of Cape Hatteras, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all ranked ten-minute squares of the area where black sea bass larvae are collected in the MARMAP survey. 2) EFH also is estuaries where black sea bass were identified as common, abundant, or highly abundant in the ELMR database for the "mixing" and "seawater" salinity zones. Generally, the habitats for the transforming (to juveniles) larvae are near the coastal areas and into marine parts of estuaries between Virginia and New York. When larvae become demersal, they are generally found on structured inshore habitat such as sponge beds.

Juveniles (NS, STI, NB): 1) Offshore, EFH is the demersal waters over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked squares of the area where juvenile black sea bass are collected in the NEFSC trawl survey. 2) Inshore, EFH is the estuaries where black sea bass are identified as being common, abundant, or highly abundant in the ELMR database for the "mixing" and "seawater" salinity zones. Juveniles are found in the estuaries in the summer and spring. Generally, juvenile black sea bass are found in waters warmer than 43 ^{o}F with salinities greater than 18 ppt and coastal areas between Virginia and Massachusetts, but winter offshore from New Jersey and south. Juvenile black sea bass are usually found in association with rough bottom, shellfish and eelgrass beds, man-made structures in sandy-shelly areas; offshore clam beds and shell patches may also be used during the wintering.

Adults (NS, STI, NB): 1) Offshore, EFH is the demersal waters over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked ten-minute squares of the area where adult black sea bass are collected in the NEFSC trawl survey. 2) Inshore, EFH is the estuaries where adult black sea bass were identified as being common, abundant, or highly abundant in the ELMR database for the "mixing" and "seawater" salinity zones. Black sea bass are generally found in estuaries from May through October. Wintering adults (November through April) are generally offshore,

south of New York to North Carolina. Temperatures above 43 ^{o}F seem to be the minimum requirements. Structured habitats (natural and man-made), sand and shell are usually the substrate preference.

Bluefin tuna (*Thunnus thynnus*)

Juveniles (NS, STI, NB): All inshore and pelagic surface waters warmer than 12° C of the Gulf of Maine and Cape Cod Bay, MA from Cape Ann, MA (~42.75° N) east to 69.75° W (including waters of the Great South Channel west of 69.75° W), continuing south to and including Nantucket Shoals at 70.5° W to off Cape Hatteras, NC (approximately 35.5° N), in pelagic surface waters warmer than 12° C, between the 25 and 200 m isobaths; also in the Florida Straits, from 27° N south around peninsular Florida to 81° W in surface waters from the 200 m isobath to the EEZ boundary.

Adults (NS, STI, NB):** In pelagic waters of the Gulf of Maine from the 50 m isobath to the EEZ boundary, including the Great South Channel, then south of Georges Bank to 39° N from the 50 m isobath to the EEZ boundary; also, south of 39° N, from the 50 m isobath to the 2,000 m isobath to offshore Cape Lookout, NC at 34.5° N. In pelagic waters from offshore Daytona Beach, FL (29.5° N) south to Key West (82° W) from the 100 m isobath to the EEZ boundary; in the Gulf of Mexico from offshore Terrebonne Parish, LA (90° W) to offshore Galveston, TX (95° W) from the 200 m isobath to the EEZ boundary.

Bluefish (*Pomatomus saltatrix)*

Juveniles (NB): 1) North of Cape Hatteras, EFH is pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ) from Nantucket Island, Massachusetts south to Cape Hatteras, in the highest 90% of the area where juvenile bluefish are collected in the NEFSC trawl survey. 2) South of Cape Hatteras, EFH is 100% of the pelagic waters over the Continental Shelf (from the coast out to the eastern wall of the Gulf Stream) through Key West, Florida. 3) EFH also includes the "slope sea" and Gulf Stream between latitudes 29^{o} 00 N and 40^{o} 00 N. 4) Inshore, EFH is all major estuaries between Penobscot Bay, Maine and St. Johns River, Florida. Generally juvenile bluefish occur in North Atlantic estuaries from June through October, Mid-Atlantic estuaries from May through October, and South Atlantic estuaries March through December, within the "mixing" and "seawater" zones (Nelson *et al.* 1991, Jury *et al*. 1994, Stone *et al.* 1994). Distribution of juveniles by temperature, salinity, and depth over the continental shelf is undescribed (Fahay 1998).

Adults (NB): 1) North of Cape Hatteras, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from Cape Cod Bay, Massachusetts south to Cape Hatteras, in the highest 90% of the area where adult bluefish were collected in the NEFSC trawl survey. 2) South of Cape Hatteras, EFH is 100% of the pelagic waters over the Continental Shelf (from the coast out to the eastern wall of the Gulf Stream) through Key West, Florida. 3) Inshore, EFH is all major estuaries between Penobscot Bay, Maine and St. Johns River, Florida. Adult bluefish are found in North Atlantic estuaries from June through October, Mid-Atlantic estuaries from April through October, and in South Atlantic estuaries from May through January in the "mixing" and "seawater" zones (Nelson *et al.* 1991, Jury *et al*. 1994, Stone *et al.* 1994). Bluefish adults are highly migratory and distribution varies seasonally and according to the size of the individuals comprising the schools. Bluefish are generally found in normal shelf salinities (> 25 ppt).

Blue shark (*Prionace glauca*)

One of the most common and widest-ranging of sharks, the blue shark is cosmopolitan in tropical, subtropical and temperate waters. It is a pelagic species that inhabits clear, deep, blue waters, usually in temperatures of 10° to 20° C, at depths greater than 180 m (Castro, 1983). Its migratory patterns are complex and encompass great distances, but are poorly understood [http://www.nmfs.noaa.gov/habitat/habitatprotection/profile/hms/blue_sharkhome.htm]. Blue sharks swim onto the continental shelf from offshore capitalizing on the productive northeast waters rich in food and reproductive opportunity [http://www.state.ma.us/dfwele/dmf/ProgramsAndProjects/shrkresc.htm].

Juveniles (STI): Neonate/early juveniles (75cm TL): North of 40E N from Manasquan Inlet, NJ to Buzzards Bay, MA in waters from 25 m to the EEZ boundary. **Late juveniles/subadults (76 to 220 cm TL):** From 45EN (offshore Cape Hatteras, NC) in waters from the 25 m isobath to the EEZ boundary.

Adults (NS, STI, NB):** Adults (221 cm TL): From 45EN (offshore Cape Hatteras, NC) in waters from the 25 m isobath to the EEZ boundary; extending around Cape Cod, MA to include the southern part of the Gulf of Maine.

Cobia (*Rachycentron canadum*)

Essential fish habitat for coastal migratory pelagic species includes sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters, from the surf to the shelf break zone, but from the Gulf Stream shoreward, including *Sargassum.* In addition, all coastal inlets, all state-designated nursery habitats of particular importance to coastal migratory pelagics. For cobia, essential fish habitat also includes high salinity bays, estuaries, and seagrass habitat. In addition the Gulf Stream is an essential fish habitat because it provides a mechanism to disperse coastal migratory pelagic larvae. For king, Spanish mackerel and cobia, essential fish habitat occurs in the South Atlantic and Mid-Atlantic Bights.

Eggs (NS, STI, NB): Most cobia eggs are found in offshore waters adjacent to the mouth of the Chesapeake Bay and south to Virginia in late June through mid-August (Shaffer and Nakamura 1989). According to the South Atlantic Fishery Management Council [http://www.safmc.net/fishid/FMPro?-DB=content&-Lay=main&pageid=about&-Format=default.html&-find], spawning occurs from late June to mid-August along the southeastern United States and from late summer to early fall in the Gulf of Mexico.

Larvae (NS, STI, NB): Most cobia larvae are found in offshore waters adjacent to the mouth of the Chesapeake Bay and south to Virginia (Shaffer and Nakamura 1989) where they may inhabit the sargassum. Similar to eggs, larvae are expected to primarily occur in the southeastern United States and in the Gulf of Mexico.

Juveniles (NS, STI, NB): Studies in Shaffer and Nakamura (1989) show early juvenile cobia will move inshore and inhabit coastal areas, near beaches, river mouths, barrier islands, lower reaches of bays and inlets, or bays of relatively high salinities. Juveniles are also preimarily documented to occur in the southeastern United States and the Gulf of Mexico.

Adults (NS, STI, NB): Adult cobia have a circumtropical distribution, and in the United States are found from Virginia to Florida and the Gulf of Mexico [http://www.safmc.net/fishid/FMPro?-DB=content&-Lay=main&pageid=about&-Format=default.html&-find]. They undergo extensive migrations from overwintering grounds near the Florida Keys to more northerly spawning/feeding grounds in spring and summer months (Richards 1967). Cobia can be found in high salinity bays, estuaries, and seagrass habitat in a variety of locations over mud, gravel, or sand bottoms, coral reefs, and man-made sloughs. They often congregate along reefs and around buoys, pilings, wrecks, anchored boats, and other stationary or floating objects.

Common thresher shark (*Alopias vulpinus*)

Larvae (STI): Neonate/early juveniles (200 cm TL): Offshore Long Island, NY and southern New England in the northeastern United States, in pelagic waters deeper than 50 m, between 70° W and 73.5° W, south to 40° N.

Juveniles (STI): Offshore Long Island, NY and southern New England in the northeastern United States, in pelagic waters deeper than 50 m, between 70° W and 73.5 W, south to 40 N.

Adults (STI): Offshore Long Island, NY and southern New England in the northeastern United States, in pelagic waters deeper than 50 m, between 70° W and 73.5° W, south to 40° N.

Dusky shark (*Carcharhinus obscurus*)

Juveniles (STI): Neonate/early juveniles (115 cm TL): Shallow coastal waters, inlets and estuaries to the 25 m isobath from the eastern end of Long Island, NY at 72° W south to Cape Lookout, NC at 34.5° N; from Cape Lookout south to West Palm Beach, FL (27.5° N), shallow coastal waters, inlets and estuaries and offshore areas to the 100 m isobath. **Late juveniles/subadults (116 to 300 cm TL):** Off the coast of southern New England from 70° W west and south, coastal and pelagic waters between the 25 and 200 m isobaths; shallow coastal waters, inlets and estuaries to the 200 m isobath from Assateague Island at the Virginia/Maryland border

(38° N) to Jacksonville, FL at 30° N; shallow coastal waters, inlets and estuaries to the 500 m isobath continuing south to the Dry Tortugas, FL at 83° W.

Haddock (*Melanogrammus aeglefinus*)

For both the Georges Bank and Gulf of Maine stocks of haddock, essential fish habitat is described as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated on Figures 2.1 - 2.4 and in the accompanying table in the EFH description document [http://www.nero.noaa.gov/ro/doc/haddock.pdf] and meet the following conditions:

Eggs (NB): Surface waters over Georges Bank southwest to Nantucket Shoals and the coastal areas of the Gulf of Maine as depicted in Figure 2.1. Generally, the following conditions exist where haddock eggs are found: sea surface temperatures below 10° C, water depths from 50 to 90 meters, and salinity ranges from 34 - 36 ‰. Haddock eggs are most often observed during the months from March to May, April being most important.

Larvae (NB): Surface waters over Georges Bank southwest to the middle Atlantic south to Delaware Bay as depicted in Figure 2.2. Generally, the following conditions exist where haddock larvae are found: sea surface temperatures below 14° C, water depths from 30 - 90 meters, and salinity ranges from 34 - 36 ‰. Haddock larvae are most often observed in these areas from January through July with peaks in April and May.

Adults (STI): Bottom habitats with a substrate of broken ground, pebbles, smooth hard sand and smooth areas between rocky patches on Georges Bank and the eastern side of Nantucket Shoals, and throughout the Gulf of Maine, plus additional area of Nantucket Shoals and the Great South Channel inclusive of the historic range as depicted in Figure 2.4. This additional area more accurately reflects historic patterns of distribution and abundance. Generally, the following conditions exist where haddock adults are found: water temperatures below 7° C, depths from 40 - 150 meters, and a salinity range from 31.5 - 35 ‰.

King mackerel (S*comberomorus cavalla*)

Essential fish habitat for coastal migratory pelagic species includes sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters, from the surf to the shelf break zone, but from the Gulf Stream shoreward, including *Sargassum.* In addition, all coastal inlets, all state-designated nursery habitats of particular importance to coastal migratory pelagics. The Gulf Stream also is an essential fish habitat because it provides a mechanism to disperse coastal migratory pelagic larvae. For king, Spanish mackerel and cobia, essential fish habitat occurs in the South Atlantic and Mid-Atlantic Bights.

Eggs (NS, STI, NB): Studies in Godcharles and Murphy (1986) reveal that king mackerel spawn in the coastal waters of the northern Gulf of Mexico, and off the southern Atlantic coast. There does not appear to be a well-defined area for spawning, but warm waters are preferred.

Larvae (NS, STI, NB): King mackerel larvae have been collected near the surface on the Atlantic coast from May through October in surface water temperatures of 26-31^{o}C and in a salinity range of 26-37 ppt (Godcharles and Murphy 1986). Larval distribution indicates that spawning occurs in the western Atlantic off the Carolinas, Cape Canaveral and Miami, Florida. There does not appear to be a well-defined area for spawning.

Juveniles (NS, STI, NB): King mackerel prefer warm waters, and seldomly enter waters below 20° C. The affinity for warm water and the availability of food result in extensive migrations along the southeastern United States, south in the fall and north in the spring. They are caught as far north as the Gulf of Maine, but more often from Virginia south to Brazil, including the Caribbean and the Gulf of Mexico.

Adults (NS, STI, NB): King mackerel adults range from the Gulf of Maine to Rio de Janeiro, Brazil. However, they are most commonly found from the Chesapeake Bay southward. Migratory patterns are driven heavily by water temperature, preferring those greater than 20^{o}C.

Little skate (*Leucoraja erinacea*)

Juveniles and adults (NS, STI, NB): EFH for juvenile and adult little skate include the areas of highest relative abundance of this species, based on the NMFS trawl survey (1963 - 1999) and ELMR data. Only the shaded squares in U.S. waters on the figures in the EFH description document

[http://www.nero.noaa.gov/ro/doc/skateefhmaps.htm] represent the EFH designation. Only habitats with sandy, gravelly, or mud substrates that occur within the shaded areas in U.S. waters are designated as EFH. This represents 58% and 57% of the observed range of juveniles and adults, respectively.

Long-finned squid (*Loligo pealei)*

Juveniles or pre-recruits (NS, STI, NB): EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where pre-recruit *Loligo* were collected in the NEFSC trawl surveys. Generally, pre-recruit *Loligo* are collected from shore to 700 ft and temperatures between 39 ^{o}F and 81 ^{o}F. *Loligo* pre-recruits are less than or equal to 8 cm.

Adults or recruits (NS, STI, NB): EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where recruited *Loligo* were collected in the NEFSC trawl surveys. Generally, recruited *Loligo* are collected from shore to 1000 ft and temperatures between 39 ^{o}F and 81 ^{o}F. *Loligo* recruits are greater than 8 cm.

Monkfish (*Lophius americanus)*

Essential Fish Habitat for monkfish is described as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated on Figures 4.1 - 4.4 in the EFH description document [http://www.nero.noaa.gov/ro/doc/monkfish.pdf] and meet the following conditions:

Eggs (STI): Surface waters of the Gulf of Maine, Georges Bank, southern New England, and the middle Atlantic south to Cape Hatteras, North Carolina as depicted in Figure 4.1. Generally, the following conditions exist where monkfish egg veils are found: sea surface temperatures below 18° C and water depths from 15 - 1000 meters. Monkfish egg veils are most often observed during the months from March to September.

Larvae (STI): Pelagic waters of the Gulf of Maine, Georges Bank, southern New England and the middle Atlantic south to Cape Hatteras, North Carolina as depicted in Figure 4.2. Generally, the following conditions exist where monkfish larvae are found: water temperatures 15° C and water depths from 25 - 1000 meters. Monkfish larvae are most often observed during the months from March to September.

Ocean pout (*Macrozoarces americanus*)

Essential Fish Habitat for ocean pout is described as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated on Figures 5.1 - 5.4 and in the accompanying table in the EFH description document [http://www.nero.noaa.gov/ro/doc/ocean-pout.pdf] and meet the following conditions:

Eggs (STI): Bottom habitats in the Gulf of Maine, Georges Bank, southern New England and the middle Atlantic south to Delaware Bay as depicted in Figure 5.1. Due to low fecundity, relatively few eggs (< 4200) are laid in gelatinous masses, generally in hard bottom sheltered nests, holes, or crevices where they are guarded by either female or both parents. Generally, the following conditions exist where ocean pout eggs are found: water temperatures below 10° C, depths less than 50 meters, and a salinity range from 32 - 34 ‰. Ocean pout egg development takes two to three months during late fall and winter.

Larvae (STI): Bottom habitats in the Gulf of Maine, Georges Bank, southern New England and the middle Atlantic south to Delaware Bay as depicted in Figure 5.2. Larvae are relatively advanced in development and are believed to remain in close proximity to hard bottom nesting areas. Generally, the following conditions exist where ocean pout larvae are found: sea surface temperatures below 10° C, depths less than 50 meters, and salinities greater than 25 ‰. Ocean pout larvae are most often observed from late fall through spring.

Adults (STI): Bottom habitats in the Gulf of Maine, Georges Bank, southern New England and the middle Atlantic south to Delaware Bay as depicted in Figure 5.4. Generally, the following conditions exist where ocean pout adults are found: water temperatures below 15° C, depths less than 110 meters, and a salinity range from 32 - 34 ‰.

Ocean quahog (*Arctica islandica*)

Juveniles (STI) and Adults (STI): Throughout the substrate, to a depth of three feet below the water/sediment interface, within federal waters from the eastern edge of Georges Bank and the Gulf of Maine throughout the Atlantic EEZ, in areas that encompass the top 90% of all the ranked ten-minute squares for the area where ocean quahogs were caught in the NEFSC surfclam and ocean quahog dredge surveys. Distribution in the western Atlantic ranges in depths from 30 feet to about 800 feet. Ocean quahogs are rarely found where bottom water temperatures exceed 60 ^{o}F, and occur progressively further offshore between Cape Cod and Cape Hatteras.

Pollock (*Pollachius virens)*

Essential Fish Habitat for pollock is described as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated on Figures 7.1 - 7.4 and in the accompanying table in the EFH description document [http://www.nero.noaa.gov/ro/doc/pollock.pdf] and meet the following conditions:

Juveniles (NS): Bottom habitats with aquatic vegetation or a substrate of sand, mud or rocks in the Gulf of Maine and Georges Bank as depicted in Figure 7.3. Generally, the following conditions exist where pollock juveniles are found: water temperatures below 18° C, depths from 0 – 250 meters, and salinities between 29 - 32 ‰.

Red hake (*Urophycis chuss*)

Essential Fish Habitat for red hake is described as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated on Figures 8.1 - 8.4 and in the accompanying table in the EFH description document [http://www.nero.noaa.gov/ro/doc/red-hake.pdf] and meet the following conditions:

Eggs (STI): Surface waters of the Gulf of Maine, Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras as depicted in Figure 8.1. Generally, the following conditions exist where hake eggs are found: sea surface temperatures below 10° C along the inner continental shelf with a salinity less than 25 ‰. Hake eggs are most often observed during the months from May - November, with peaks in June and July.

Larvae (NB, STI): Surface waters of Gulf of Maine, Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras as depicted in Figure 8.2. Generally, the following conditions exist where red hake larvae are found: sea surface temperatures below 19° C, water depths less than 200 meters, and a salinity greater than 0.5 ‰. Red hake larvae are most often observed from May through December, with peaks in September through October.

Juveniles (NB, STI): Bottom habitats with a substrate of shell fragments, including areas with an abundance of live scallops, in the Gulf of Maine, on Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras as depicted in Figure 8.3. Generally, the following conditions exist where red hake juveniles are found: water temperatures below 16° C, depths less than 100 meters and a salinity range from 31 - 33 ‰.

Adults (NB): Bottom habitats in depressions with a substrate of sand and mud in the Gulf of Maine, on Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras as depicted in Figure 8.4. Generally, the following conditions exist where red hake adults are found: water temperatures below 12° C, depths from 10 - 130 meters, and a salinity range from 33 - 34 ‰.

Sandbar shark (Carcharhinus plumbeus)

Habitat Areas of Particular Concern: Important nursery and pupping grounds have been identified in shallow areas and the mouth of Great Bay, NJ, lower and middle Delaware Bay, lower Chesapeake Bay, MD and near the Outer Banks, NC, in areas of Pamlico Sound adjacent to Hatteras and Ocracoke Islands and offshore those islands.

Juveniles (STI): Neonates/early juveniles (90 cm): Shallow coastal areas to the 25 m isobath from Montauk, Long Island, NY at 72° W, south to Cape Canaveral, FL at 80.5° W(all year); nursery areas in shallow coastal waters from Great Bay, NJ to Cape Canaveral, FL, especially Delaware and Chesapeake Bays (seasonal-summer); also shallow coastal waters to up to a depth of 50 m on the west coast of Florida and the Florida Keys from Key Largo at 80.5° W north to south of Cape San Blas, FL at 85.25° W. Typical parameters: salinity-greater than 22 ppt; temperatures-greater than 21° C. **Late juveniles/subadults (91 to 179 cm):** Offshore southern New England and Long Island, all waters, coastal and pelagic, north of 40° N and west of 70° W; also, south of 40° N at Barnegat Inlet, NJ, to Cape Canaveral, FL (27.5° N), shallow coastal areas to the 25 m isobath; also, in the winter, from 39° N to 36° N, in the Mid-Atlantic Bight, at the shelf break, benthic areas between the 100 and 200 m isobaths; also, on the west coast of Florida, from shallow coastal waters to the 50 m isobath, from Florida Bay and the Keys at Key Largo north to Cape San Blas, FL at 85.5° W.

Adults (NB, STI): On the east coast of the United States, shallow coastal areas from the coast to the 50 m isobath from Nantucket, MA, south to Miami, FL; also, shallow coastal areas from the coast to the 100 m isobath around peninsular Florida to the Florida panhandle at 85.5° W, near Cape San Blas, FL including the Keys and saline portions of Florida Bay.

Scup (*Stenotomus chrysops*)

Eggs (NB): EFH is estuaries where scup eggs were identified as common, abundant, or highly abundant in the ELMR database for the "mixing" and "seawater" salinity zones. In general scup eggs are found from May through August in southern New England to coastal Virginia, in waters between 55 and 73 ^{o}F and in salinities greater than 15 ppt.

Larvae (NB): EFH is estuaries where scup were identified as common, abundant, or highly abundant in the ELMR database for the "mixing" and "seawater" salinity zones. In general scup larvae are most abundant nearshore from May through September, in waters between 55 and 73 ^{o}F and in salinities greater than 15 ppt.

Juveniles (NS, STI, NB): 1) Offshore, EFH is the demersal waters over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked ten-minute squares of the area where juvenile scup are collected in the NEFSC trawl survey. 2) Inshore, EFH is the estuaries where scup are identified as being common, abundant, or highly abundant in the ELMR database for the "mixing" and "seawater" salinity zones. Juvenile scup, in general during the summer and spring are found in estuaries and bays between Virginia and Massachusetts, in association with various sands, mud, mussel and eelgrass bed type substrates and in water temperatures greater than 45 ^{o}F and salinities greater than 15 ppt.

Adults (NS, STI, NB): 1) Offshore, EFH is the demersal waters over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked ten-minute squares of the area where adult scup are collected in the NEFSC trawl survey. 2) Inshore, EFH is the estuaries where scup were identified as being common, abundant, or highly abundant in the ELMR database for the "mixing" and "seawater" salinity zones. Generally, wintering adults (November through April) are usually offshore, south of New York to North Carolina, in waters above 45 ^{o}F.

Shortfin mako shark (*Isurus oxyrhinchus*)

Juveniles (NS, STI, NB): Neonate/early juveniles (95 cm TL):** Between the 50 and 2,000 m isobaths from Cape Lookout, NC, approximately 35° N, north to just southeast of Georges Bank (approximately 42° N and 66° W) to the EEZ boundary; and between the 25 and 50 m isobaths from offshore of the Chesapeake Bay (James River) (North Carolina/Virginia border) to a line running west of Long Island, NY to just southwest of Georges Bank, approximately 67° W and 41° N. **Late juveniles/subadults (96 to 279 cm TL):** Between the 25 and 2,000 m isobaths from offshore Onslow Bay, NC north to Cape Cod, MA; and extending west between 38° N and 41.5° N to the EEZ boundary.

Short-finned squid (*Illex illecebrosus*)

Juveniles or pre-recruits (NS, STI, NB):** EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina in areas that

comprise the highest 75% of the catch where pre-recruit *Illex* were collected in the NEFSC trawl surveys. Generally, pre-recruit *Illex* are collected from shore to 600 ft and temperatures between 36 °F and 73 °F. *Illex* pre-recruits are less than or equal to 10 cm.

Adults or recruits (NS, STI, NB):** EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine through Cape Hatteras, North Carolina in areas that comprise the highest 75% of the catch where recruited *Illex* were collected in the NEFSC trawl surveys. Generally, recruited *Illex* are collected from shore to 600 ft and temperatures between 39 °F and 66 °F. *Illex* recruits are greater than 10 cm.

Spanish mackerel (*Scomberomorus maculates)*

Essential fish habitat for coastal migratory pelagic species includes sandy shoals of capes and offshore bars, high profile rocky bottom and barrier island ocean-side waters, from the surf to the shelf break zone, but from the Gulf Stream shoreward, including *Sargassum.* In addition, all coastal inlets, all state-designated nursery habitats of particular importance to coastal migratory pelagics. The Gulf Stream is also an essential fish habitat because it provides a mechanism to disperse coastal migratory pelagic larvae. For king, Spanish mackerel and cobia, essential fish habitat occurs in the South Atlantic and Mid-Atlantic Bights.

Eggs (NS, STI, NB): All life stages of Spanish mackerel are primarily seen in waters above 17.7°C and within a salinity range of 32-36 ppt (Godcharles and Murphy 1986).

Larvae (NS, STI, NB): Larvae are generally found in surface water temperatures of 19.6-29.8°C and in a high salinity range of 28.3-37.4 ppt or higher.

Juveniles (NS, STI, NB): Apparently, some juvenile Spanish mackerel use estuaries as nursery grounds, but most stay nearshore in open beach waters (Godcharles and Murphy 1986). The waters surrounding the mouths of freshwater rivers are most often avoided. All life stages of Spanish mackerel are primarily seen in waters above 17.7°C and within a salinity range of 32-36 ppt (Godcharles and Murphy 1986).

Adults (NS, STI, NB): Spanish mackerel adults range from the Gulf of Maine to the Yucatan Peninsula, but are considered uncommon north of the Chesapeake Bay. Migratory patterns are driven by water temperature, preferring a range of 21.1-31.1°C. All life stages of Spanish mackerel are primarily seen in waters above 17.7°C and within a salinity range of 32-36 ppt (Godcharles and Murphy 1986). They will spawn off the North Carolina and Virginia coasts over a long period between late spring and late summer.

Spiny dogfish (*Squalus acanthias*)

Juveniles (STI): 1) North of Cape Hatteras, EFH is the waters of the Continental shelf from the Gulf of Maine through Cape Hatteras, North Carolina in areas that encompass the highest 90% of all ranked ten-minute squares for the area where juvenile dogfish were collected in the NEFSC trawl surveys. 2) South of Cape Hatteras, EFH is the waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1280 ft. 3) Inshore, EFH is the "seawater" portions of the estuaries where dogfish are common or abundant on the Atlantic coast, from Passamaquoddy Bay, Maine to Cape Cod Bay, Massachusetts. Generally, juvenile dogfish are found at depths of 33 to 1280 ft in water temperatures ranging between 37 °F and 82 °F.

Adults (STI): 1) North of Cape Hatteras, EFH is the waters of the Continental shelf from the Gulf of Maine through Cape Hatteras, North Carolina in areas that encompass the highest 90% of all ranked ten-minute squares for the area where adult dogfish were collected in the NEFSC trawl surveys. 2) South of Cape Hatteras, EFH is the waters over the Continental Shelf from Cape Hatteras, North Carolina through Cape Canaveral, Florida, to depths of 1476 ft. 3) Inshore, EFH is the "seawater" portions of the estuaries where dogfish are common or abundant on the Atlantic coast, from Passamaquoddy Bay, Maine to Cape Cod Bay, Massachusetts. Generally, adult dogfish are found at depths of 33 to 1476 ft in water temperatures ranging between 37 °F and 82 °F.

Summer flounder (*Paralichthys dentatus*)

Habitat Areas of Particular Concern: The specific designation of HAPC for summer flounder is as follows: All native species of macroalgae, seagrasses, and freshwater and tidal macrophytes in any size bed, as well as loose

aggregations, within adult and juvenile summer flounder EFH is HAPC. If native species of SAV are eliminated then exotic species should be protected because of functional value, however, all efforts should be made to restore native species.

Eggs (NS, STI, NB): 1) North of Cape Hatteras, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of the all the ranked ten-minute squares for the area where summer flounder eggs are collected in the MARMAP survey. 2) South of Cape Hatteras, EFH is the waters over the Continental Shelf (from the coast out to the limits of the EEZ), from Cape Hatteras, North Carolina to Cape Canaveral, Florida, to depths of 360 ft. In general, summer flounder eggs are found between October and May, being most abundant between Cape Cod and Cape Hatteras, with the heaviest concentrations within 9 miles of shore off New Jersey and New York. Eggs are most commonly collected at depths of 30 to 360 ft.

Larvae (NS, STI, NB): 1) North of Cape Hatteras, EFH is the pelagic waters found over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked ten-minute squares for the area where summer flounder larvae are collected in the MARMAP survey. 2) South of Cape Hatteras, EFH is the nearshore waters of the Continental Shelf (from the coast out to the limits of the EEZ), from Cape Hatteras, North Carolina to Cape Canaveral Florida, in nearshore waters (out to 50 miles from shore). 3) Inshore, EFH is all the estuaries where summer flounder were identified as being present (rare, common, abundant, or highly abundant) in the ELMR database, in the "mixing" (defined in ELMR as 0.5 to 25.0 ppt) and "seawater" (defined in ELMR as greater than 25 ppt) salinity zones. In general, summer flounder larvae are most abundant nearshore (12-50 miles from shore) at depths between 30 to 230 ft. They are most frequently found in the northern part of the Mid-Atlantic Bight from September to February, and in the southern part from November to May.

Juveniles (NS, STI, NB): 1) North of Cape Hatteras, EFH is the demersal waters over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked ten-minute squares for the area where juvenile summer flounder are collected in the NEFSC trawl survey. 2) South of Cape Hatteras, EFH is the waters over the Continental Shelf (from the coast out to the limits of the EEZ) to depths of 500 ft, from Cape Hatteras, North Carolina to Cape Canaveral, Florida. 3) Inshore, EFH is all of the estuaries where summer flounder were identified as being present (rare, common, abundant, or highly abundant) in the ELMR database for the "mixing" and "seawater" salinity zones. In general, juveniles use several estuarine habitats as nursery areas, including salt marsh creeks, seagrass beds, mudflats, and open bay areas in water temperatures greater than 37 ^{o}F and salinities from 10 to 30 ppt range.

Adults (NS, STI, NB): 1) North of Cape Hatteras, EFH is the demersal waters over the Continental Shelf (from the coast out to the limits of the EEZ), from the Gulf of Maine to Cape Hatteras, North Carolina, in the highest 90% of all the ranked ten-minute squares for the area where adult summer flounder are collected in the NEFSC trawl survey. 2) South of Cape Hatteras, EFH is the waters over the Continental Shelf (from the coast out to the limits of the EEZ) to depths of 500 ft, from Cape Hatteras, North Carolina to Cape Canaveral, Florida. 3) Inshore, EFH is the estuaries where summer flounder were identified as being common, abundant, or highly abundant in the ELMR database for the "mixing" and "seawater" salinity zones. Generally summer flounder inhabit shallow coastal and estuarine waters during warmer months and move offshore on the outer Continental Shelf at depths of 500 ft in colder months.

Surf clam (*Spisula solidissima*)

Juveniles and Adults (NS, STI, NB): Throughout the substrate, to a depth of three feet below the water/sediment interface, within federal waters from the eastern edge of Georges Bank and the Gulf of Maine throughout the Atlantic EEZ, in areas that encompass the top 90% of all the ranked ten-minute squares for the area where surfclams were caught in the NEFSC surfclam and ocean quahog dredge surveys. Surfclams generally occur from the beach zone to a depth of about 200 feet, but beyond about 125 feet abundance is low.

Whiting (*Merluccius bilinearis*)

Essential Fish Habitat for whiting is described as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated on Figures 13.1 - 13.4 and in the

accompanying table in the EFH description document [http://www.nero.noaa.gov/ro/doc/whiting.pdf] and meet the following conditions:

Eggs (STI): Surface waters of the Gulf of Maine, Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras as depicted in Figure 13.1. Generally, the following conditions exist where most whiting eggs are found: sea surface temperatures below 20°C and water depths between 50 and 150 meters. Whiting eggs are observed all year, with peaks from June through October.

Larvae (STI): Surface waters of the Gulf of Maine, Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras as depicted in Figure 13.2. Generally, the following conditions exist where most whiting larvae are found: sea surface temperatures below 20°C and water depths between 50 and 130 meters. Whiting larvae are observed all year, with peaks from July through September.

Adults (STI): Bottom habitats of all substrate types in the Gulf of Maine, on Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras as depicted in Figure 13.4. Generally, the following conditions exist where most whiting adults are found: water temperatures below 22°C and depths between 30 and 325 meters.

Windowpane flounder (*Scophthalmus aquosus*)

Essential Fish Habitat for windowpane flounder is described as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated on Figures 14.1 - 14.4 and in the accompanying table in the EFH description document [http://www.nero.noaa.gov/ro/doc/windowpane.pdf] and meet the following conditions:

Eggs (NB, STI): Surface waters around the perimeter of the Gulf of Maine, on Georges Bank, southern New England, and the middle Atlantic south to Cape Hatteras as depicted in Figure 14.1. Generally, the following conditions exist where windowpane flounder eggs are found: sea surface temperatures less than 20°C and water depths less than 70 meters. Windowpane flounder eggs are often observed from February to November with peaks in May and October in the middle Atlantic and July - August on Georges Bank.

Larvae (NB, STI): Pelagic waters around the perimeter of the Gulf of Maine, on Georges Bank, southern New England, and the middle Atlantic south to Cape Hatteras as depicted in Figure 14.2. Generally, the following conditions exist where windowpane flounder larvae are found: sea surface temperatures less than 20°C and water depths less than 70 meters. Windowpane flounder larvae are often observed from February to November with peaks in May and October in the middle Atlantic and July through August on Georges Bank.

Juveniles (NB, STI): Bottom habitats with a substrate of mud or fine-grained sand around the perimeter of the Gulf of Maine, on Georges Bank, southern New England and the middle Atlantic south to Cape Hatteras as depicted in Figure 14.3. Generally, the following conditions exist where windowpane flounder juveniles are found: water temperatures below 25°C, depths from 1 – 100 meters, and salinities between 5.5 - 36 ‰.

Adults (NS, STI, NB): Bottom habitats with a substrate of mud or fine-grained sand around the perimeter of the Gulf of Maine, on Georges Bank, southern New England and the middle Atlantic south to the Virginia-North Carolina border as depicted in Figure 14.4. Generally, the following conditions exist where windowpane flounder adults are found: water temperatures below 26.8°C, depths from 1 - 75 meters, and salinities between 5.5 - 36 ‰.

Winter Flounder (*Pseudopleuronectes americanus*)

Essential Fish Habitat for winter flounder is described as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated on Figures 15.1 - 15.4 and in the accompanying table in the EFH description document [http://www.nero.noaa.gov/ro/doc/winter.pdf] and meet the following conditions:

Eggs (NS, STI, NB): Bottom habitats with a substrate of sand, muddy sand, mud, and gravel on Georges Bank, the inshore areas of the Gulf of Maine, southern New England, and the middle Atlantic south to the Delaware Bay as depicted in Figure 15.1. Generally, the following conditions exist where winter flounder eggs are found: water

temperatures less than 10° C, salinities between 10 - 30 ‰, and water depths less than 5 meters. On Georges Bank, winter flounder eggs are generally found in water less than 8°C and less than 90 meters deep. Winter flounder eggs are often observed from February to June with a peak in April on Georges Bank.

Larvae (NS, STI, NB): Pelagic and bottom waters of Georges Bank, the inshore areas of the Gulf of Maine, southern New England, and the middle Atlantic south to the Delaware Bay as depicted in Figure 15.2. Generally, the following conditions exist where winter flounder larvae are found: sea surface temperatures less than 15° C, salinities between 4 - 30 ‰, and water depths less than 6 meters. On Georges Bank, winter flounder larvae are generally found in water less than 8°C and less than 90 meters deep. Winter flounder larvae are often observed from March to July with peaks in April and May on Georges Bank.

Juveniles (NS, STI, NB): ***Young-of-the-Year***: Bottom habitats with a substrate of mud or fine grained sand on Georges Bank, the inshore areas of the Gulf of Maine, southern New England and the middle Atlantic south to the Delaware Bay as depicted in Figure 15.3. Generally, the following conditions exist where winter flounder young-of-the-year are found: water temperatures below 28°C, depths from 0.1 - 10 meters, and salinities between 5 - 33 ‰. ***Age 1+Juveniles***: Bottom habitats with a substrate of mud or fine grained sand on Georges Bank, the inshore areas of the Gulf of Maine, southern New England and the middle Atlantic south to the Delaware Bay as depicted in Figure 15.3. Generally, the following conditions exist where juvenile winter flounder are found: water temperatures below 25°C, depths from 1 - 50 meters, and salinities between 10 - 30 ‰.

Adults (NS, STI, NB): Bottom habitats including estuaries with a substrate of mud, sand, and gravel on Georges Bank, the inshore areas of the Gulf of Maine, southern New England and the middle Atlantic south to the Delaware Bay as depicted in Figure 15.4. Generally, the following conditions exist where winter flounder adults are found: water temperatures below 25° C, depths from 1 - 100 meters, and salinities between 15 - 33 ‰.

Winter skate (*Leucoraja ocellata*)

Juveniles and adults (NS, STI, NB): EFH for juvenile and adult winter skate include the areas of highest relative abundance of this species, based on the NMFS trawl survey (1963 - 1999) and ELMR data. Only the shaded squares in U.S. waters on the figures in the EFH description document [http://www.nero.noaa.gov/ro/doc/skateefhmaps.htm] represent the EFH designation. Only habitats with a substrate of sand and gravel or mud that occur within the shaded areas in U.S. waters are designated as EFH. This represents 48% and 44% of the observed range of juveniles and adults, respectively.

Witch flounder (*Glyptocephalus cynoglossus*)

Essential Fish Habitat for witch flounder is described as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated on Figures 16.1-16.4 in the EFH description document [http://www.nero.noaa.gov/ro/doc/witch.pdf] and meet the following conditions:

Larvae (STI): Surface waters to 250 meters in the Gulf of Maine, Georges Bank, the continental shelf off southern New England, and the middle Atlantic south to Cape Hatteras as depicted in Figure 16.2. Generally, the following conditions exist where witch flounder larvae are found: sea surface temperatures below 13° C over deep water with high salinities. Witch flounder larvae are most often observed from March through November, with peaks in May - July.

Yellowtail flounder (*Limanda ferruginea*)

For all four stocks of yellowtail flounder, essential fish habitat is described as those areas of the coastal and offshore waters (out to the offshore U.S. boundary of the exclusive economic zone) that are designated on Figures 17.1 - 17.4 and in the accompanying table in the EFH description document [http://www.nero.noaa.gov/ro/doc/yellowtail.pdf] and meet the following conditions:

Eggs (STI): Surface waters of Georges Bank, Massachusetts Bay, Cape Cod Bay, and the southern New England continental shelf south to Delaware Bay as depicted in Figure 17.1. Generally, the following conditions exist where yellowtail eggs are found: sea surface temperatures below 15° C, water depths from 30 - 90 meters and a salinity range from 32.4 to 33.5 ‰. Yellowtail flounder eggs are most often observed during the months from mid-March to July, with peaks in April to June in southern New England.

Larvae (STI): Surface waters of Georges Bank, Massachusetts Bay, Cape Cod Bay, the southern New England shelf and throughout the middle Atlantic south to the Chesapeake Bay as depicted in Figure 17.2. Generally, the following conditions exist where yellowtail larvae are found: sea surface temperatures below 17° C, water depths from 10 - 90 meters, and a salinity range from 32.4 - 33.5 ‰. Yellowtail flounder larvae are most often observed from March through April in the New York bight and from May through July in southern New England and southeastern Georges Bank.

Juveniles (NS*, STI, NB):** Bottom habitats with a substrate of sand or sand and mud on Georges Bank, the Gulf of Maine, and the southern New England shelf south to Delaware Bay as depicted in Figure 17.3. Generally, the following conditions exist where yellowtail flounder juveniles are found: water temperatures below 15° C, depths from 20 - 50 meters and a salinity range from 32.4 - 33.5 ‰.

Adults (STI): Bottom habitats with a substrate of sand or sand and mud on Georges Bank, the Gulf of Maine, and the southern New England shelf south to Delaware Bay as depicted in Figure 17.4. Generally, the following conditions exist where yellowtail flounder adults are found: water temperatures below 15° C, depths from 20 - 50 meters, and a salinity range from 32.4 - 33.5 ‰.

Notes

* Although this life stage is listed in the EFH grid, there is no designated EFH for this life stage according to the figures in the EFH description document [http://www.nero.noaa.gov/ro/doc/list.htm] at this site.

** - Listed for NB alternative because this life stage is listed on the grid that encompasses Horseshoe Shoal in Nantucket Sound, part of the NB combination alternative. This life stage is not listed within the grid that encompasses New Bedford or Buzzards Bay.

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